

ABSTRACT OF THE DISCLOSURE

A data storage unit includes a data storage layer with multiple storage areas having a storage medium disposed thereon that changes between a plurality of states for writing and reading information. An array of beam emitters, such as laser light probes or near- field light sources, are spaced in close proximity to the data storage layer. A layer adjacent to the storage layer (LASL) generates carriers (electrons, holes or photons) in response to the light beams. Data is read by directing a light beam onto the data storage layer. The storage medium on the data storage layer affects the generation of carriers or alters the transport of carriers after generation by the LASL, depending upon the state of the storage medium. The carriers are detected in a detection region in carrier communication with the LASL to detect the presence of data. The detection region may comprise any type of region for detecting carriers, including a semiconductor diode junction and a photoconductive region. The presence of data in the storage areas is determined by the number of carriers transported across the semiconductor junction or the number of carriers transported in the photoconductive regions between electrodes.

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